Collider Run II Shot Setup Documentation

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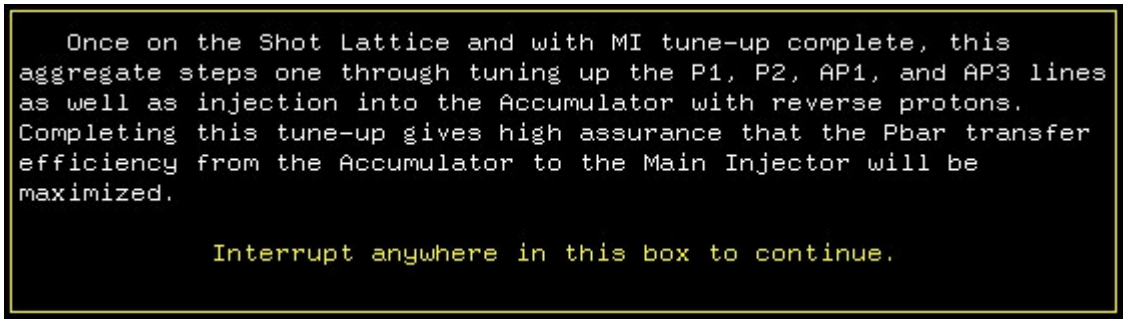
Last Edit by Brian Drendel 4-3-05
Send suggestions and comments to ad-pbar-tuning-adminNOSPAM@fnal.gov (remove "NOSPAM")

Sequencer: Pbar
Collider Aggregate: **Run II Finish Reverse Protons**
Previous Aggregate: Run II Switch to Shot Lattice
Purpose of this Aggregate: This aggregate completes the beam line tune-up.
How to get back to stacking form here: Finish this aggregate and then run both the Run II Revert to Stack Lattice and the Run II Return to Stacking aggregates.

::: INSTRUCT 219 .



::: SHOT_LOG COMMENT .
Enters the following comment into the Pbar portion of the shot scapbook at http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=scrap03.
Time- Finishing MI and Pbar reverse proton tune up. The Stack size is ###.#########. - Sequencer

::: WAIT_DEVICE V:MSHOOT .
Waits for state V:MSHOOT to arrive at a value of 4 (Reverse Proton Tuneup complete).

::: EVENT 9C DISABLE .
Disabled the TCLK $9C Accumulator sudden beam loss.

::: BEAM_SWITCH Pbar_Source Off .
Turn off the Pbar beam switch

::: BOOST_INTENSITY EVT16 1 .
Sets Booster TCLK event $16 to 1 turn 35 bunches.

::: CTLIT_DEVICE D:BSC925 ON .
Open the AP3 beam stop

::: CTLIT_DEVICE D:ESEPV ON .
::: CTLIT_DEVICE A:ISEP1V ON .
::: CTLIT_DEVICE A:ISEP2V ON .
::: CTLIT_DEVICE A:IKIK ON D
::: CTLIT_DEVICE A:EKIK ON .
::: CTLIT_DEVICE A:EKIKQ ON D
::: INSTRUCT 212 .

It is now time to tune up the P1 to AP3 lines. The Sequencer sets the intensity to 1 turn, 35 bunches, opens the AP3 beam stop, and starts P150, the beam line tune up application. The page acts like a sequencer.
Strive to achieve an orbit with ~≤1.5 mm rms in both planes or 85% MI to Accumulator efficiency, whichever comes first.

If P1 BPM data looks unstable, please go to I39:
- Select the P1 LINE
- Check/set the Type: PROT

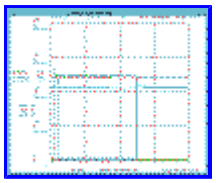
Should you wish to monitor devices while tuning and be able to easily restore them, call up P60/EXT/<37,38> to see Horizontal and Vertical devices, respectively.

Interrupt anywhere in this box to continue.

::: AUTO_PLOT Beamline tuneup .

Starts a FTP on the screen of the operator's choice to plots beam transfer efficiencies.

- Main Injector DCCT beam intensity readback I:IBEAMM from 0-0.32E12
- AP1 toroid beam intensity readback M:TOR105 from 0-32E10.
- AP3 toroid beam intensity readback M:TOR910 from 0-32E10.
- Accumulator DCCT beam intensity readback A:IBEAMB from stack size - stack size + 32 e10.
- All plotted over a time of 0-4 seconds triggered on an event $93.



::: START_PGM P150 .

Starts P150 Reverse Proton Tune-up for P1-AP3 application (keeper is Keith Gollwitzer).

::: BEAM_SWITCH Pbar_Source On .

Turn back on the Pbar switch to prepare to except beam.

::: INSTRUCT 214 .

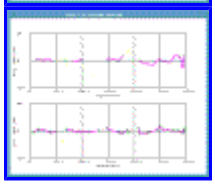
Wait here until the beamline tuneup is complete. CLICK HERE before moving on to the TBT tuneup. The sequencer lowers the intensity to 1 turns, 7 bunches before the TBT tune up is started.

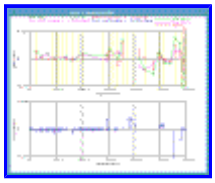
Updated! D:H926 is now adjusted from P150 via the device D:H926RP (reverse protons). At the end of this aggregate the current on the Pbar cycles, D:H926PB, is automatically set to match the final value of D:H926RP. elvin 9 mar 04

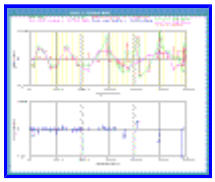
Interrupt anywhere in this box to continue.

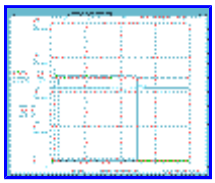
P150 Tuneup Procedure.


Start the application and click on SEQUENCER in the menubar. Start the sequencer





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::: SETIT_DEVICE V:PSHOOT =7          .
      Sets the state V:PSHOOOT to 7 (Pbar Beamline Tuneup Complete).
::: BOOST_INTENSITY EVT16 1           .
      Set Booster beam event $16 to 1 turn 7 bunches.
::: ACKNOWLEDGE                       .
```


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::: LOAD_TLG 9      REPEAT            .
      Loads TLG 9 which is described in the instruct below.
::: WAIT_DEVICE G:TLGSEQ              .
      Wait for the timeline 19 to be loaded.
::: INSTRUCT 216                      .
```

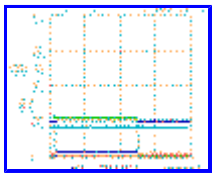
```
   The Accumulator TBT timeline has just been loaded. This is
nominally TLG #19. For Mixed Pbars, #9 is used.
   This timeline contains only one reverse proton cycle preceded by
an $80 and also contains a $2B and a $2A for either Tevatron
reverse injection or MI tune up. For Mixed Pbars, check that the
$2E ramp is correct if this has not been checked already.
   P162 is about to be started to minimize Accumulator Turn-by-Turn
oscillations. Strive to achieve data points within the innermost
circle of the bulls-eye plot.

            Interrupt anywhere in this box to continue.
```

::: AUTO_PLOT TBT eff .

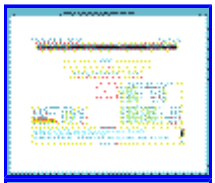
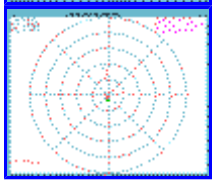
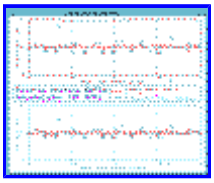
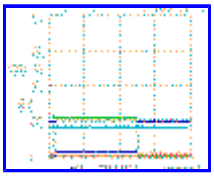
Starts a FTP on the screen of the operator's choice to plots beam transfer efficiencies.

- Main Injector DCCT beam intensity readback I:IBEAMS from 0-15E10
- AP1 toroid beam intensity readback M:TOR105 from 0-15E10.
- AP3 toroid beam intensity readback M:TOR910 from 0-15E10.
- Accumulator DCCT beam intensity readback A:IBEAMB from stack size - stack size + 15 e10.
- All plotted over a time of 0-3.2 seconds triggered on an event $93.

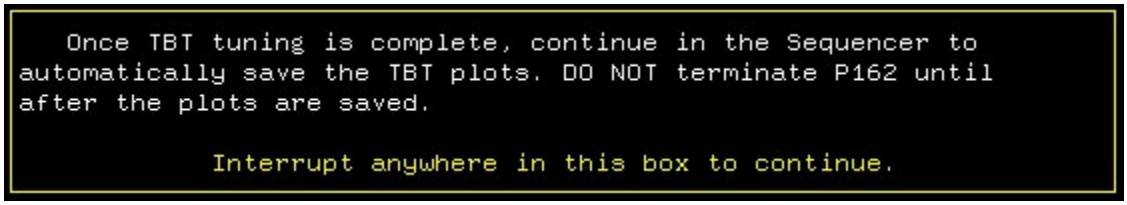


::: START_PGM P162 .

Starts P162 Accumulator BPM TBT and oscillation minimization (Gollwitz).

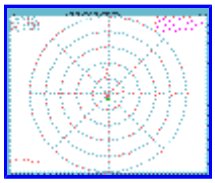





::: INSTRUCT 215 .

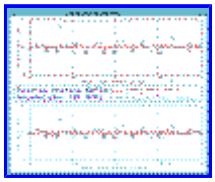


::: ACKNOWLEDGE .

::: COPY_SCREEN LCL MY SLOT .
Copies the Accumulator TBT polar plot to save file.

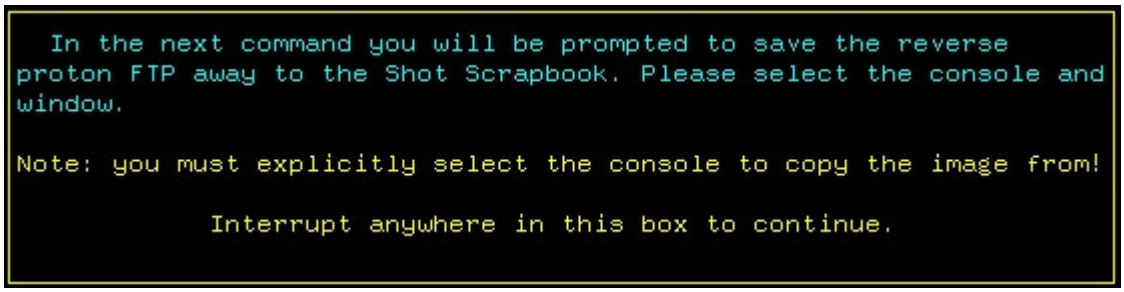


::: COPY_SCREEN LCL MY SLOT .
Copies the Accumulator TBT difference orbit to save file.



::: SHOT_LOG IMAGE .
Copies the above two TBT images to Pbar portion of the shot scrapbook at
http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=scrap03

::: INSTRUCT 217 .



::: SHOT_LOG IMAGE .
Copies the above two TBT images to Pbar portion of the shot scrapbook at
http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=scrap03

::: BEAM_SWITCH Pbar_Source Off .
Turn off the Pbar beam switch.

::: CHECK_DEVICE A:CENFRQ READING .
Checks the value of the Accumulator center revolution frequency parameter and prints the value in the message box on the sequencer.

::: CHECK_DEVICE A:VFACCM READING .
Checks the value of the Main Injector to Accumulator frequency parameter and prints the value in the message box on the sequencer.

::: CTLIT_DEVICE A:DPHLPI OFF D
Turn off the Accumulator horizontal damper.

::: CTLIT_DEVICE A:DPVLPI OFF D

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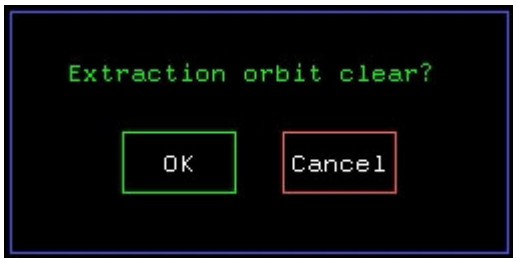
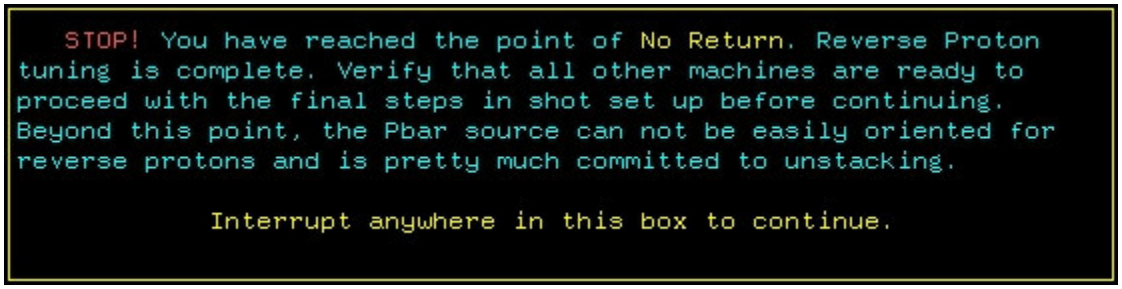
      Turn off the Accumulator vertical damper.
::: CTLIT_DEVICE A:EKIK   ON       .
::: CTLIT_DEVICE A:EKIKQ  ON       D
::: ACKNOWLEDGE                   .
```




```
::: CTLIT_DEVICE A:EKIK   OFF      .
::: CTLIT_DEVICE A:EKIKQ  OFF      D
::: CTLIT_DEVICE A:IKIK OFF        .
::: CTLIT_DEVICE A:ISEP1V OFF      .
::: CTLIT_DEVICE A:ISEP2V OFF      .
::: CTLIT_DEVICE D:EKIK OFF        .
::: CTLIT_DEVICE D:EKIKQ OFF       D
::: CTLIT_DEVICE D:ESEPV  OFF      .
```




```
::: CHECK_DEVICE A:SCRES  RESTORE  .
::: CHECK_DEVICE D:EKIKM1 RESTORE  .
::: CHECK_DEVICE D:EKIKM2 RESTORE  .
::: CHECK_DEVICE D:EKIKM3 RESTORE  .
::: CHECK_DEVICE A:ISEP1V RESTORE  .
::: CHECK_DEVICE A:ISEP2V RESTORE  .
ok  SET_DEVICE D:H926PB D:H926RP   .
```

Collider Aggregate: **Run II Finish Reverse Protons** has been completed.

Next Aggregate: Run II Continue Shot Setup

How to get back to stacking form here: Finish this aggregate and then run both the Run II Revert to Stack Lattice and the Run II Return to Stacking aggregates.